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[EXTRACTED FROM THE ANNUAL REPORT OF THE COMMISSIONER
OF FISH AND FISHERIES FOR 1886.]

REPORT

ON

THE MEDUSÆ

COLLECTED BY THE

U. S. FISH COMMISSION STEAMER ALBATROSS,

IN THE

REGION OF THE GULF STREAM,

IN

1885 AND 1886.

BY

J. esse WALTER FEWKES.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1889.

Gift of BRYANT WALKER MAR 31 1917

V.—REPORT ON THE MEDUSÆ COLLECTED BY THE U. S. FISH COMMISSION STEAMER ALBATROSS IN THE REGION OF THE GULF STREAM, IN 1885-'86.

By J. Walter Fewkes.

The following paper considers the Medusæ collected in the summers of the years 1885 and 1886 off the eastern coasts of the United States, in the region of the Gulf Stream. In this collection there are many genera which have already been described from this locality, and others which are believed to be new to science. Many belong to the so-called deep-sea fauna, and some, formerly supposed to be limited to great depths, are recorded by the collector from the surface waters.

Among Siphonophores, some of the most interesting are new specimens of the gigantic physophore, *Pterophysa.* One specimen in the collection of these animals reaches the great length of 23 feet in alcohol. Next to certain recorded specimens of the genus *Apolemia*, this is one of the largest Physophores yet described, and is the largest yet reported from the waters of the Gulf Stream contiguous to our coast. The new genus *Pleurophysa* is interesting in its relationship to the Rhizophysidæ, and the somewhat peculiar characters of the polypites.

Stomatoca periphylla is recorded for the first time from the western waters of the Atlantic.

A new *Pegantha*, a genus which has never before been found in the Gulf Stream, is described. As more and more specimens of the interesting genus *Atolla*, ascribed by Hæckel to the deep-sea fauna, are collected, the number of specimens from the surface water is increased. In the present collection we have three more examples of this medusa from the surface. This fact would seem to indicate that the genus is not necessarily confined to the great depth at which it was collected by the Challenger.

Halicreas and *Solmaris incisa* are found in the collection, and new facts for the acceptance of the deductions made from previously known specimens recorded.

Ephyroides rotaformis is represented by several specimens.

A new Ctenophore, of the known genus *Callianira*, is recorded for the first time from the waters of the Gulf Stream.

As more and more is known of the medusan life of the Gulf Stream, we see how rich in new genera the waters of this current are, and what a good collecting locality it presents for a discovery of new genera, species, and even families of these pelagic organisms.

This paper, like those with a similar title which have preceded it, is preliminary to a final report on North American Hydrozoa, which the author has in preparation.

SIPHONOPHORA.

PNEUMATOPHORÆ.

Family RHIZOPHYSIDÆ.

PTEROPHYSA, Fewkes.

In the collection of 1883 a Siphonophore was recorded, to which, from the peculiar wings or ptera on the polypites, the name *Pterophysa* was given.

The stem of this specimen is very much twisted, and the float and other portions so contracted that it was impossible for me to make out the anatomy of any part except polypites. The wings of the polypites are, however, so exceptional, that it seemed justifiable to refer this specimen on this ground to a new genus.

Pterophysa differs from any Rhizophysid in this and certain other features of the anatomy, which are well marked in the new specimens recently collected. In the collection of 1883 a giant float was found, which, although at that time not recognized as belonging to *Pterophysa*, after study of new material is thought to belong to this genus.

Among the collections made by Mr. A. Agassiz, in the Blake, there is also a huge Siphonophore, which has ptera on the polypites, and seems to belong to the same genus. These are the physophores ("*Rhizophysa*") mentioned by A. Agassiz in a letter to the Superintendent of the Coast Survey.*

In the collections of the Albatross, in 1885, there are fresh specimens of *Pterophysa*, which throw light on some points in the anatomy of this curious Rhizophysid. The specimens are as follows:

	Catalogue number.	Station.
1................	10435	2398
2................	11685	2570

Of the new specimens, No. 1 is the best preserved and the largest. Both were found twisted on the dredge wire or rope. Neither of the specimens have the body complete, but from the fragments of both several common details can be made out. No. 1 is destitute of a float; No. 2 has the float well developed.

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* Letter No. 3. *Bull. Mus. Comp. Zoöl.* Vol. V, No. 14, pp. 289-290.

PTEROPHYSA GRANDIS, Fewkes.

[No. 1.]

The stem of this specimen is approximately 20 feet in length in alcohol. It is ribbon-shaped, about 3^{mm} broad. Not twisted. Color in alcohol, white. No float present, but this structure is ruptured from its connection.

The terminal polypite is 40^{mm} in length, elongated, finger-shaped, with dark color near its distal end. On the proximal third of its length it bears two well-marked lateral bands or ptera, which are placed opposite each other on the polypite. The terminal polypite arises from a point on the axis where the stem is somewhat thickened. The surface of the thickened stem is nodose, probably from contraction. A short fragment of a tentacle springs from its base of attachment to the stem. The stem narrows above the nodose enlargement, becomes again thickened as it recedes from the polypite, and then diminishes in size to the flat, ribbon-like shape of the stem.

The penultimate polypite is elongated, finger-like, 50^{mm} in length, enlarged into a knob at the distal or oral end. In the proximal region, on each side, there are two marked ptera. The penultimate polypite is similar to the terminal, and arises from the stem by a long thread similar to but smaller than the peduncle. The filamentary union of the polypite to the stem arises from a tangled cluster of thread-like bodies on the stem. These bodies possibly correspond to the immature lateral branches of the tentacle.

Between the region of the stem from which the tangled lateral bodies arise and the other (opposite) end of the stem there are several polypites, all of which have similar filamentous attachments to the flat (in alcohol) axis, as the ultimate and penultimate. Many small clusters of sexual bodies, confined as a general thing to the flat axis, are noticed. These bodies have, like the sexual glands of *Rhizophysa*, the form of botryoidal clusters.

[No. 2.]

In this specimen a float and the proximal end of the axis are well preserved. The whole axis is 1.9^{m} long.

The float is large, 15^{mm} in length, and appears to be carried upright, as in *R. eysenhardtii*, Geg. It has an apical opening. This opening is surrounded by a zone of reddish pigment. From the pneumatophore hang digitiform appendages into the cavity of the pneumatocyst, as in the genus *Rhizophysa*. The walls of both pneumatocyst and pneumatophore are thin. At the base of the pneumatocyst the stem becomes thick and swollen, while lower down, more distally from the float, it tapers gradually and becomes flat, as in the first specimen. On the one side of the thickened region of the stem there arises a small cluster of flask-shaped bodies, in the form of elongated, digitiform structures, which may be undeveloped polypites. Below (more distally from the float) the latter structures we find a number of polypites, more or less thickened by contraction, which are arranged in clusters. No tentacles observed attached to them. Nine polypites (one broken in examination) were counted in the largest cluster.

The distal end of the stem now (distally from the float) diminishes in diameter, and a second cluster of flask-shaped bodies is seen. When this second cluster is closely examined it is found to be composed of four polypites, brought together by a contraction of the stem. These polypites have ptera, but no tentacles. The last of the second cluster of polypites, the most distant from the float of any yet considered, is 60^{mm} from the apex of the float. The stem, between the first and second clusters of polypites, is muscular, more or less folded and nodose by contraction. It sometimes shows an infolded groove on one side.

The diameter of the stem distally from the second cluster of polypites diminishes very considerably, and after the addition to the number of existing polypites of two more, we find a long bare interval of the axis.

In addition to the long fragment of *Pterophysa* in No. 2, there are two other fragments of large size, which seem to belong to the same animal. Both of these fragments have a nodose stem, which appears much twisted and contorted. The first fragment is about 250^{mm} long, and at one end is flat, and seems to be broken from the axis of the larger specimen in the same bottle. It is enlarged about midway in its length, and at one end bears a swollen nodose body, from which arises a polypite. This polypite has a tentacle, which arises from one side.*

If we compare this fragment and its polypite with the terminal polypite of the specimen already described (No. 2), we find a close resemblance in many particulars. A swollen nodose body is present in both. Tentacles exist in both. The fragment is therefore regarded a terminal polypite.

In another fragment of No. 2 we have a long undivided part, which bifurcates and becomes nodose at the free ends, while a botryoidal body, homologous with a sexual gland, arises from one of the bifurcations.

PTEROPHYSA, sp. incog.

In the collection made by Mr. Agassiz in the Caribbean Sea there are a few mutilated specimens of a *Pterophysa*, the polypites of which have a close likeness to the above, although I have not been able to satisfactorily study the other organs. These specimens, in one or two instances, are destitute of a float, but when that organ is present it has the same cluster of flask-shaped immature polypites below it as in *Pterophysa*. The polypites themselves have the lateral wings.

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* It is possible that in my account of the polypites of *Pterophysa* collected by the Albatross in 1883, I have exaggerated the grasping power of the ptera of these organs. As I then stated, "It is difficult to determine definitely the function of the ptera and the peculiar structure of the polypites of *Pterophysa*, unless we study the animal alive."

Specimens of Pterophysa collected by the Blake.

Station.	Locality.
205	Off Martinique.
110	Kingston, St. Vincent. (Lat., 20° 10′ 30″ N.; long., 74° 19′ 20″.)
108	Off Nuevitas.

gen. incog.

Among the Siphonophores collected by the Blake is one from St. Kitt's, which I have not been able to identify on account of its fragmentary nature. The fragments consist of large numbers of polypites. The stem, float, and other organs are wanting. One or both ends of the polypite has a very dark red or purple (red) color. There are no lateral ptera. The polypites are about 40^{mm} in length.

PLEUROPHYSA, gen. nov.

P. INSIGNIS, sp. nov.

Among the new Rhizophysidæ are many specimens of a genus which is different from any yet described, and which probably is a new genus as well as species. The specimens are very numerous and come from the following localities:

Catalogue number.	Station.	North latitude.	West longitude.
		° ′ ″	° ′ ″
12100	2543 2585 2584	39 55 15	70 42 30

Pleurophysa is destitute of nectocalices and hydrophyllia. The axis is thick (in alcohol), and all the appendages arise from one side of the stem.

Float small, pyriform, pigmented at the apex, with thin walls. Just below the float there is a small cluster of stylated spherical bodies, which occupy the same position as the undeveloped nectocalices in other physophores.

The region of the stem below the cluster of stylated bodies is thickened, and bears on one side a row of knobs. These were at first thought to be the line of attachment of nectocalices. In a large number of specimens, however, no sign of a nectocalyx was discovered.

The distal end of the anterior stem (portion from which the knobs arise) is marked by a cluster of spherical or club-shaped bodies, which in some of the specimens have a reddish color even in alcohol. These botryoidal clusters resemble sexual bodies. The distal region of the stem from the cluster of bodies last mentioned is much longer than the anterior, and bears on one side a double row of flask-shaped bodies closely crowded together. These bodies are fimbriated on one side by small lateral appendages, and are thought to be polypites. No tentacles were observed, and no clusters of sexual bodies or immature tentacular knobs at the bases of the polypites. No clusters of sexual bodies on the axis between the union of the supposed polypites and the axis.

The polyp stem is spirally coiled in many of the specimens. No hydrophyllia. Tasters, unknown.

It must be said that the interpretation given to the different organs which has been given above is somewhat conjectural. Of the float, stem, and polypites there can be little doubt. It seems probable that the cluster of bodies which separate the anterior stem from the polyp stem are sexual bodies.

The nectocalices and hydrophyllia are easily ruptured from the stem, and their absence may simply be due to this fact. It seems strange that among so many specimens not even a fragment of these bodies is found, while in specimens of *Agalma*, collected by the same collectors, these gelatinous structures are well preserved. We shall, therefore, look with interest to a new collection of *Pleurophysa* and a study of better-preserved specimens for anatomical details, which this account necessarily leaves in great imperfection.

Family PHYSALIADÆ.

PHYSALIA ARETHUSA, Tilesius.

This physophore is one of the most commonly collected of all the siphonophores of the Gulf Stream. In the collections of 1885–'86 it is recorded from the following localities:

Catalogue number.	Station.	North latitude.			West longitude.		
		°	′	″	°	′	″
11637	2566	37	23	00	68	08	00
11639	2567	37	43	00	66	56	00
15233	2711	38	59	00	70	07	00
15255	2712	38	20	00	70	05	30
15754	2723	36	47	00	73	09	30
15755	2725	36	34	00	73	48	00
15762	2727	36	35	00	74	03	30

PHYSOPHORÆ.

Family AGALMIDÆ.

{ AGALMA OKENII, Esch.
{ CRYSTALLODES RIGIDUM, Hæck.

Catalogue number.	Station.	North latitude.	West longitude.
		° ′ ″	° ′ ″
11838	Hyd. 743	41 15 30	64 23 00
11684	2569	39 26 00	68 03 30
11647	2570		
11676	2566	37 23 00	68 08 00
15264	2712	38 20 00	70 05 30

HIPPOPODIÆ.

Family HIPPOPODIDÆ.

GLEBA HIPPOPUS, Forskal.

Catalogue number.	Station.	North latitude.	West longitude.
		° ′ ″	° ′ ″
11676	2566	37 23 00	68 08 00
11684	2569	39 26 00	68 03 30
12111	2566	37 23 00	68 08 00
11683	2566	37 23 00	68 08 00

DIPHYÆ (CALYCOPHORÆ).

Family ABYLAIDÆ.

ABYLA TRIGONA, Quoy & Gaimard.

Catalogue number.	Station.	North latitude.	West longitude.
		° ′ ″	° ′ ″
11670	2566	37 23 00	68 08 00

This is the first mention of *A. trigona* from the Gulf Stream, although I have seen specimens from the Caribbean Sea.

A fragment of the posterior Nectocalyx.

Family DIPHYIDÆ.

EPIBULIA AURANTIACA, Vogt.

Catalogue number.	Station.	North latitude.	West longitude.
		° ′ ″	° ′ ″
11836	Hyd. 753	40 18 30	53 39 30
12109	2543	39 58 15	70 42 30

DIPHYES, sp.

Catalogue number.	Station.	North latitude.	West longitude.
		° ′ ″	° ′ ″
11836	Hyd. 753	40 18 30	53 39 30

MUGGIÆA, sp.?

Among the Diphyid-like Medusæ are many specimens which have the anterior nectocalyx only. All of these I have placed in the genus *Muggiæa*, following Chun[*] in his limitation of the generic name *Muggiæa* to Diphyids with one nectocalyx, which resembles the anterior nectocalyx of the genus *Diphyes*. Our Atlantic species somewhat resembles *M. kochii*, but differs from it in several particulars. In the absence of more knowledge of the live animal, I will provisionally refer this to an unknown species of *Muggiæa*.

Catalogue number.	Station.	North latitude.	West longitude.
		° ′ ″	° ′ ″
15227	2711	38 59 00	70 07 00
15254	2715	38 29 30	70 54 30
15755	2725	36 34 00	73 48 00

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[*] Ueber die cyclische Entwickelung und Verwandtschafts-Verhältnisse der Siphonophoren. *Sitzungsber. Akad. Wiss.*, LII, pp. 1155–1172. Berlin, 1882.

DISCOIDEA.

Family VELELLIDÆ.

VELELLA MUTICA, BOSC.

Catalogue number.	Station.	North latitude.			West longitude.		
		°	′	″	°	′	″
11644	Hyd. 753	40	18	30	53	39	30
15748	2727	36	35	00	74	03	30
15749	2723	36	47	00	73	09	30
15751	2727	36	35	00	74	03	30
15755	2725	36	34	00	73	48	00

Family PORPITIDÆ.

PORPITA LINNÆANA.

Catalogue number.	Station.	North latitude.			West longitude.		
		°	′	″	°	′	″
11640	2536	39	56	15	70	47	30
11641	2537	39	56	45	70	50	30
11642	2538	39	57	30	70	51	15
11643	2566	37	23	00	18	08	00

CRASPEDOTA.

Family ÆQUORIDÆ, Eschscholtz.

POLYCANNA, Hæckel.

It is very difficult to distinguish the genera and species of the above family, especially the American representatives.

A. Agassiz describes three species of *Zygodactyla* from our coast: *Z. grœnlandica* Ag., *Z. crassa* A. Ag., and *Z. cyanea*, A. Ag. Hæckel places *Z. grœnlandica*, *Z. crassa*, and *Cremastoma flava*, A. Ag., in the genus *Polycanna*, Hæckel, while *Z. cyanea* A. Ag. is referred to his genus *Mesonema* as *M. cyaneum*. According to A. Agassiz, the tentacles in *Z. grœnlandica*, *Z. crassa*, and *C. flava* are more numerous than the chymiferous tubes. This is true also, according to Hæckel, of *P. vitrina*, Hæck. In *P. germanica* and *P. italica*, Hæck., the tubes and tentacles correspond in number, while in *P. fungina*, Hæck., the radial tubes are more numerous than the tentacles. These characters form the three subgenera:

1. *Rhacostoma.* Radial tubes more numerous than tentacles.
2. *Cremastoma.* Radial tubes equal in number to the tentacles.

3. *Zygodactyla.* Tentacles more numerous than the radial tubes.

It is evident from what we know of the development of the Medusa (gonophore) of *Z. grœnlandica* (?) that the relative number of tentacles and radial tubes varies with age, and consequently the three subgenera are difficult to separate on this feature alone. There are specimens of *Polycanna* in the collection with characters of the first subgenus *Rhacostoma*, to which I have already given the name *P. americana.* It is believed that we have at least two species of *Polycanna* on our New England coast, and provisionally these may be known as *P. grœnlandica* and *P. americana.* The basis of the separation of the two is the existence in the former of rows of subumbral knobs between the chymiferous tubes and the absence of these knobs in the latter. It happens that in the latter the number of tentacles is less than the number of chymiferous tubes, while in the former, according to A. Agassiz, the number of tentacles is greater than that of the radial tubes.*

It seems to me that the presence or absence of the subumbral knobs is a much safer character to rely upon in the separation of our species of *Polycanna* than any which has yet been suggested. If new investigation shall show that true specimens of *grœnlandica* do not have subumbral knobs, our New England species is possibly new. From the fact that a supposed type specimen of *Polycanna*, labeled *Z. grœnlandica*, in the collection of the Museum of Comparative Zoology, has these tubercles, the name *grœnlandica* is retained for this species.

There is another *Zygodactyla*-like Medusa in which I have not been able to find these gelatinous knobs, either in a live animal or in alcoholic representatives. As this species also differs from the species *crassa* and *cyanea* in the relative number of tentacles and chymiferous tubes, it is supposed to be the new species, *americana.*

Unlike all other American *Zygodactylæ*, as described by A. Agassiz, this species has a smaller number of tentacles than of radial tubes, and at the same time none of the alcoholic specimens have subumbral tubercles. It is possible that the former feature indicates an immature Medusa, but not so the latter; for, as has been already shown, the subumbral tubercles are present in the Medusa when very small.

Specimens referred to *P. americana* were collected in the following localities:

Catalogue number.	Station.	North latitude.			West longitude.		
		°	'	"	°	'	"
11650	2563	39	18	30	71	23	30
11665	2567	37	45	00	66	56	00
11673	2566	37	23	00	68	08	00
11674	2563 ?	39	18	30	71	23	30
11677	2566	37	23	00	68	08	00
? 11649	2539	39	59	45	70	53	00

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* The existence of radial subumbral knobs and a larger number of tentacles than radial tubes is supposed to characterize *grœnlandica*, although the knobs are not mentioned in A. Agassiz's description.

POLYCANNA AMERICANA,* Fewkes.

Of all the specimens of the species examined in the collection of 1885, No. 11674, station 2563, is the best preserved. A diagnosis of the species is made from this specimen.

Disk flat, with a slight apical protuberance. Roof of the stomach convex, thicker than the margin. Diameter of the roof of the stomach, 28^{mm}. Diameter of the disk, 70^{mm}. Stomach wide, lips open. The stomach wall is formed by papillate folds, the number of which is equal to the tubes. These tubes fall down below the velum. Numerous (107) chymiferous tubes, each of which bears a folded sexual gland, reaching from the vicinity of the stomach to the marginal vessel.

Tentacles, 29–32? in number, long, base inflated. Between each pair of tentacles there are five or more small protuberances on the bell margin. These are either otocysts or immature tentacles. No subumbral tubercles on the umbrella, between the chymiferous tubes.

Of the other recorded *Polycannæ*, *P. grœnlandica*, *P. flava*, and *P. crassa* have more tentacles than chymiferous tubes. No tubercles are recorded in *P. flava*. In an alcoholic specimen of *Zygodactyla*, with tubercles, now in the collection of the Museum of Comparative Zoology, the tentacles are missing. I cannot, therefore, say at present whether the specimens with tubercles have the same number of tentacles as tubes or not. If the *Zygodactyla*, with tubercles, last mentioned, has more tentacles than tubes it may be *grœnlandica;* if less, it is doubtful whether it is the same as the species (*grœnlandica*) which is recorded by A. Agassiz as possessed of more tentacles than tubes.

Family AMPHINEMIDÆ, Hæckel.

STOMATOCA† PERIPHYLLA, Hæckel.

Catalogue number.	Station.	North latitude.	West longitude.
		° ′ ″	° ′ ″
15229	2711	38 59 00	70 07 00
15253	2713	38 20 00	70 08 30

Two well-preserved specimens of this species were found by the Albatross in the summer of 1886.

We have in our waters two very beautiful genera of the family of Tiaridæ, with two opposite tentacles. One of these is the well known

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* This species is supposed to be the same, or closely allied to the genus once called *Rhegmatodes*, now *Polgcanna*. It is given the former name in the plates, the latter in the text of Hæckel's System der Medusen. The species falls in Hæckel's subgenus *Rhacostoma* (L. Agassiz, *sensu mutato*) and may be the same as *P. fungina*, Hæck.

† The spelling, *Stomatoca*, is adopted instead of *Stomotóca*, from the derivation στόμα (gen. στόματος) root στοματ.

S. apicata (*Amphinema apicatum*, Hæckel); the other, the *Dinematella*, Fewkes. Both of these have in the adult condition an apical prominence on the bell, which in the former is without internal cavity, and in the latter with a cavity. *Stomatoca periphylla*, Hæckel, is destitute of this prominence, is much larger, and the stomach is situated on an especial "Magenstiel." In this species the mouth lappets, stomach with sexual bodies, lie outside the bell cavity. The specimens agree substantially with Hæckel's description, except that the tentacular bulbs at the base of the tentacles are more swollen than he represents in his figure (Pl. iv, fig. 10, Das System der Medusen). It is probable from the studies of Hincks, Allman, and Hæckel that the young of this species has for its hydroid a genus related to or identical with *Perigonimus*. This notice is the first record of *S. periphylla*, from the Western Atlantic.

Family GERYONIDÆ, Eschscholtz.

LIRIOPE SCUTIGERA, McCr.

Catalogue number.	Station.	North latitude.	West longitude.
		° ′ ″	° ′ ″
15229	2711	38 59 00	70 07 00
15253	2713	38 20 00	70 08 30

Family CUNANTHIDÆ, Hæckel.

CUNINA ?

Among the Narcomedusæ there are a few specimens of a *Cunina*-like medusa which is temporarily referred to this genus. The specimen was so mutilated that it was impossible to tell whether it was a *Cunina* or a *Solmaris*, although from the character of the festoon canal and the existence of gastral pouches, it seems more closely allied to the former genus. It was not possible to see the gastral pouches, one of the main characters of the Cuninidæ, in several of the specimens, although they are well seen in one of the same.

Specimens examined.

Catalogue number.	Station.	North latitude.	West longitude.
		° ′ ″	° ′ ″
....	2585	....	....
11687	2569	39 26 00	68 03 30

The collar lobes of these specimens are girt by a horseshoe-shaped festoon canal, as in the Peganthidæ, but the bell is more flexible and not crossed by the radial elevations and depressions upon the exumbrella.*

Umbrella flat, discoid, with a ring of sexual bodies divided into as many lobes as tentacles and alternating with them. In each marginal lobe there is a genital sac, which is free from the wall of the lobes on the floor of the gastral pouches.

Tentacles numerous, 20 to 22 or more in number, springing from the sides of the body or the peripheral border of the umbrella. Tentacles longer than the diameter of the bell. The marginal collar is composed of as many lobes as there are tentacles, and each has a festoon canal. Peroniæ wanting. ?

The following notes were made from a specimen with 22 tentacles: Umbrella flat, lens-shaped or discoidal. Color, transparent, white in alcohol, flabby, gelatinous. Outer surface (exumbrella) smooth. The body divided into a central region and a peripheral collar.

Central region plano-convex or double convex. The greater convexity is below. Diameter in alcohol, 20^{mm}.

Upper surface flat. No coronal fossa or annular indentation at the rim near the origin of the tentacles.

The marginal collar is composed of twenty-two marginal lappets joined laterally by a thin membrane. The festoon canal broad, extending from tentacle to tentacle in well-marked horseshoe shaped-loops. No sense bodies were seen, on account of the poor preservation of the specimen.

The festoon canal seems to open on each side of the tentacle into the central stomach cavity. The edge of the marginal lappets is girt by a thin velum. The tentacles are long (longer than the diameter of the bell) and are inserted into the gelatinous substance of the bell by a conical root extending radially. No peronia and no marked marginal canal besides the festoon canal. Twenty-two gastral pouches. The stomach is a dish-shaped cavity bounded above by the under surface of the central region of the disk and below by the wall of the stomach. Well-marked gastral pouches. The mouth has a broad opening without protruding lips.

The sexual bodies lie in a ring on the peripheral region of the lower stomach walls in the gastral pouches. In the specimen with twenty-two tentacles these organs were not seen.

In other and larger specimens in which, however, in one instance at least, there are not as many tentacles, the sexual bodies take the form of sacs hanging in the lower wall of the stomach between the radii of the tentacles. In one case these glands are very much inflated; in another they have the form of a simple band. Of the species of *Cunina* from the Atlantic,* *C. campanulata*, Esch. has ten gastral pouches, *C. oligotis*, Hæckel, has sixteen. Of Mediterranean *Cuninæ*, *C. vitrea*, Gegenbaur, has ten to twelve gastral pouches; *C. lativentris*, Gegenbaur, the same number; and *C. prolifera*, Gegenbaur, sixteen. *C. rhododactyla*, Hæckel, has ten to fifteen gastral pouches, and *C. rubiginosa* ten to twelve. A species from the Pacific Ocean, *C. mucilaginosa*, Blain., and one from the Indian Ocean, *C. multifida*, Hæckel, have respectively twenty to twenty-four and thirty-two stomach pouches. These latter, however, appear to differ from my *Cunina* in the length of the tentacles and other structural details. Our specimens therefore may be looked upon either as of a new species or more mature adults of species already described.

---

* The species of *Cunina*, *C. discoides*, may eventually turn out to be one of the Atlantic species of *Solmaris*. It may be the young of *S. coronantha*, Hæckel.

These specimens were at first referred to *Solmissus* in a provisional examination of them. The structures which I have interpreted as the festoon canals would throw them out of the genus *Solmissus*. *S. faberi* Hæckel, has twenty-four gastral pouches, and *S. bleekii* thirty-two.

Subfamily TAMOYIDÆ, Hæckel.

CARYBDEA (TAMOYA) HAPLONEMA, F. Müller.

Specimens of this medusa were taken at the following localities:

Catalogue number.	Station.	North latitude.			West longitude.		
		°	′	″	°	′	″
11679	2566	37	23	00	68	08	00
11686	2566	37	23	00	68	08	00

Claus † considers *Tamoya* the old genus, *Carybdea*, Peron et Lesueur. Hæckel ‡ describes a medusa, which the above specimens closely resemble as *Carybdea pyramis*, Hæckel. The latter author separates *Carybdea* from *Tamoya*. My specimens resemble more closely his *Carybdea* than *Tamoya*. They are larger than *C. pyramis* and smaller than *T. haplonema*. If the two genera are separated our medusæ more closely resembles *Carybdea*, but I have followed Claus in regarding them as the same. This medusa appears to be the same as that which is mentioned as *Tamoya* in the collection of 1883–'84. §

---

* *Cunina discoides*, Fewkes, was probably described from an immature specimen. No gastral pouches were observed, and it is therefore probable that it belongs to the Solmaridæ. It is possibly the young of *Solmaris coronantha*, Hæckel.

† Ueber *Carybdea marsupialis*. *Arbeit. Zool. Inst. Wien.*, I Heft., 1878.

‡ Das System der Medusen, pp. 440, 443.

§ *Cf.* Report on Albatross Medusæ for 1883–'84. *Ann. Rept. Com. Fish and Fisheries*, 1884, p. 951.

Family HALICREASIDÆ, Fewkes.

HALICREAS MINIMUM, Fewkes.

Specimens of *Halicreas* were taken from the following locality:

Catalogue number.	Station.	North latitude.	West longitude.
		° ′ ″	° ′ ″
15244	2719	38 29 30	71 58 00
15750	2728	36 30 00	74 03 30

This genus is recognized by the eight tuberculated projections on the exumbral margin of the bell. From these projections there extend to the vicinity of the center of the bell eight ribs or radial depressions, which appear on the subumbral surface as radial depressions between which the octants of the subumbrella are somewhat swollen. Near the center of the subumbrella is a ring of eight knobs which lie one in each octant between the above-mentioned depressions.

There is a well marked vellum below the marginal projections. The radial projections appear as elevations on the exumbral side of the bell in alcoholic specimens.

In my former paper* I referred this genus to the Narcomedusæ of Hæckel. There is no reason from a study of new material to change that opinion of the affinities of the family of Halicreasidæ.

Family PEGANTHIDÆ, Hæckel.

Among the families of Narcomedusæ described by Hæckel is the Peganthidæ, a family without radial canals and gastric pouches in the subumbrella but with a festoon canal. The sexual bodies are either lobed or form a non-continuous band on the under floor of the stomach.

Among the medusæ collected by the Albatross is one which has a close likeness to the genus *Pegantha* of the Peganthidæ but which differs from the known species of this genus so widely that it may be necessary later to call it a new species.

This *Pegantha* somewhat resembles *P. quadriloba*, although the genital sacs are not as markedly four-lobed as Hæckel's description of this species would seem to indicate. It has marked lobes in the sexual glands, but the poor condition of preservation and the rupture in one or two instances of the gland from its attachment rendered it impossible for me to tell to what species this *Pegantha* belongs.

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* *Bull. Mus. Comp. Zool.*, ix, 8, p. 306. In one of the two specimens of *Halicreas* there described, sausage-shaped sexual bodies were observed hanging from the underside of the bell. In one of the above specimens (15750) glandular bodies were observed in the subumbral radial furrows.

PEGANTHA, sp.

[Plate 1.]

The sexual bodies divided into a number of separate sacs pendant from the abaxial lower wall of the stomach. The sexual glands do not enter the umbrella lobes but alternate with the attachments of the tentacles, which they equal in number. No coronal fossa.*

Specimen examined.

Catalogue number.	Station.	North latitude.	West longitude.
		° ′ ″	° ′ ″
11654	2559	39 48 00	71 48 30

Bell, crown-shaped, twice as broad as high, with stiff gelatinous walls. The bell is thick, biconvex, firm. The marginal lobes folded inward on the oral side so that they are with difficulty bent back to normal position without rupture. Exumbrella crossed by strongly-marked, prominent radial ridges, separated by radial furrows. These ridges and furrows arise from the center of the exumbrella in the radii of the marginal lappets and divide, sending off lateral branches which pass into the marginal lappets.

The collar of the umbrella, or the peripheral portion of the bell, is made up of thirteen horseshoe-shaped marginal lobes with festoon canals. These lobes are connected by a thin membrane which unites contiguous lobes and skirts their borders. The specimen was not well enough preserved to observe the sense-bodies.

The subumbrella is divided into two regions, one corresponding with the central disk and marked by the lower stomach wall; the other with the collar region formed by the horseshoe lappets. The mouth opening is simple. The lower stomach wall thick, well marked. The sexual sacs form a number of pouches upon the outer rim of the lower stomach wall. They appear as folds or separated sacs, the exact number of which could not be determined in the single specimen studied. There are thirteen sexual glands, each of which lies in an internemal radius. An open niche is formed in each marginal lappet, as described by Hæckel, in which the sexual organs are forced when the medusa bends inward the lobes of the collar. There are thirteen tentacles, each of which arises in the incisions formed by the horse-shoe-shaped festoon canal. They are long and slender, apparently hollow, and have the same color as the bell.

---

* The surface of the exumbrella is continuous and without division between the disk part of the umbrella and the marginal lobes. *P. pantheon*, which this species in some respects closely resembles, has a "deep horizontal coronal fossa."

Family SOLMARIDÆ, Hæckel.

SOLMARIS INCISA, Fewkes.

Catalogue number.	Station.	North latitude.	West longitude.
11667	2429	° ′ ″ 42 55 30	° ′ ″ 50 51 00

Several large specimens of this giant Narcomedusa occur in the collections; in one of these the form of the bell is unmutilated and the subumbral elevations and depressions well shown. The velarium is undivided into marginal lappets, showing that my conjecture of the non-existence of separate lappets in the jelly-fish is borne out by a study of fresh material. There are in the largest specimen (entire) thirty subumbral depressions. There are thirty tentacles and the same number of peroniæ. No festoon canal.

Many of the "marginal lappets" in other specimens are united, indicating, as already suggested, the existence of connections along the peroniæ, which are split in most of the specimens studied. The velarium is formed by a union of all the marginal lappets, and recalls that of other Solmaridæ.

The feature upon which the species is built is the radial grooves on the under side of the umbrella, as already elsewhere described. These "radial-furchen" resemble structures in *Cunina campanulata*, where, according to Hæckel, they are on the "untere magenwand." In *S. incisa* these furrows are on the upper wall of the stomach or the under wall of the disk.

A new examination of *S. incisa* to determine, if possible, whether I might not be mistaken in my identification, and whether my specimen does not belong to *C. campanulata* has convinced me that my specimens have no festoon canals, and differ in many other ways from *Cunina*. *S. incisa* is more disk-like than campanulate, is larger than *Campanulata* and has more tentacles. Instead of gastral pouches in the pernemal radii there are prominent umbral elevations. The furrows are internemal. In one specimen the edges of the gastral furrows were lined with a white structure which may be the remnants of the attachment of the ovaries. The species differs so greatly from other *Solmares* that it may probably be found to be a new genus.

This animal is a giant among the Narcomedusæ. The only genus of the group which approaches it in size is *Polyxenia*, of which *P. cyanostylis*, Esch., according to Eschscholtz is 80^{mm} in diameter. According to Hæckel a species found by him was one-third smaller than that of

Eschscholtz. The largest of the other genera of Narcomedusæ are 50mm in diameter, one-half the size of large specimens of *S. incisa.*

In all specimens of *S. incisa* found, the under wall of a stomach is supposed to be ruptured and absent. The liability of this to occur in Solmaridæ has led me to suppose the same thing possible in my new species.

ACRASPEDA.

Family COLLASPIDÆ, Hæckel.

ATOLLA BAIRDII, Fewkes.

No.	Catalogue number.	Station.	North latitude.	West longitude.	Depth.
			° ′ ″	° ′ ″	*Fathoms.*
3	11603	2428	42 46 00	50 55 30	826
4	15756	2732	37 27 00	73 33 00	1152

No.	Tentacles.	Marginal lappets.	Sense bodies.	Diameter of central disk.	Breadth of corona.
				mm.	*mm.*
3	23	46	23	40	18
4	22	44	22	40	18

ATOLLA VERRILLII, Fewkes.

No.	Catalogue number.	Station.	North latitude.	West longitude.	Depth.	Number of specimens.
			° ′ ″	° ′ ″		
9	11672	2569	39 26 00	68 3 30	1872	1
10 11 12	15236	2717	38 24 00	71 13 00	Surface.	3

No.	Tentacles.	Marginal lappets.	Sense bodies.
9	26	52	26
10	28	56	28
11	28	56	28
12	22	44	22

The two species of American *Atollæ*, *A. bairdii* and *A. verrillii*, can be readily distinguished by the size of the marginal sense bodies, which in the latter are larger, longer, and narrower than in the former. The number of tentacles in *bairdii* is generally twenty-two, while in *verrillii* we find several specimens with twenty-eight. Why Hæckel has assigned from sixteen to thirty-two tentacles to the Collaspidæ does not appear from what we already know of the genera (*Collaspis* and *Atolla*) which compose the family. The least number of tentacles observed in any of my *Atollæ* is twenty-two. Hæckel records an *Atolla* with nineteen tentacles. The greatest number of tentacles observed in any *Atolla* is twenty-eight in my species *verrillii.* It is not denied that it is possible that *Atollæ* with less than nineteen or more than twenty-eight tentacles may be later observed, but until these are found it is well to include the limits in the number observed (nineteen, *teste* Hæckel), twenty-two to twenty-eight.

The deepest limit in the ocean at which *Atolla* has been recorded is 2,369 fathoms. Many specimens are recorded from the surface. *Atolla* has been found by the Albatross within the following geographical limits: Lat. 38° 19′ 26″ to 42° 46′, long. 50° 55′ 30″ to 71° 58′. The Albatross has collected thirteen specimens of the genus.

The genus *Collaspis*, Hæck., of which several drawings are published by Hæckel (System der Medusen, Pl. xxviii), was collected "by Smith" between Kerguelen and Crozet Islands in "about 1,000 fathoms," according to Hæckel. The expedition upon which this specimen was collected is not mentioned, but the great depth from which it is said to have been taken excites more than usual interest in it. Very few, if any, other hauls besides those of the Challenger have been made at this depth in this remote locality, and this seems to be the only medusa ascribed to "Smith" from this locality. Hæckel's description of *Collaspis* was made from a very much mutilated specimen, which he reconstructed from his knowledge of *Atolla*, and allowed a drawing of the medusa thus reconstructed to be published. On account of what might be regarded as suspicious circumstances, under which Hæckel's description of *Collaspis* was made, the genus is not recognized.

According to Filhol (La Vie au Fond des Mers, p. 244) *Atolla* is found "dans l'Atlantique sud et dans l'Atlantique nord au niveau du canal des Faröer." The species of the *Atolla*, from the latter locality, is not mentioned by Filhol, and it is probably the same as one of mine, *A. bairdii* or *A. verrillii.*

The increase in number of specimens from the surface would indicate that *Atolla* is found on the surface of the ocean as well as at great depths. The data for this statement are those of the collector. I have already discussed the limitations which necessarily exist to a rigid acceptance of the recorded depths ascribed to this and other so-called deep-sea medusæ.

Family PERIPHYLLIDÆ, Hæckel.

PERIPHYLLA HYACINTHINA,* Steen.

Catalogue number.	Station.	North latitude.			West longitude.		
		°	′	″	°	′	″
11651	2427	42	46	00	51	00	00
11655	2565	38	19	20	69	02	30
11662	2429	42	55	30	50	51	00
15750	2728	36	30	00	74	33	00
15756	2732	37	27	00	73	33	00

Family EPHYRIDÆ, Hæckel.

EPHYROIDES ROTAFORMIS, Fewkes.

Several more specimens of this remarkable genus and species were collected by the Albatross in 1886. Although all were in good condition as far as the bell and subumbral radial elevations are concerned, the finer anatomy could not be made out.

Catalogue number.	Station.	North latitude.			West longitude.		
		°	′	″	°	′	″
15236	2717	38	24	00	71	13	00
15249	2719	38	29	30	71	58	00
15256	2717	38	24	00	71	13	00
15266	2712	38	20	00	70	05	30

Ephyroides is characterized as follows: On the subumbral surface of a thick umbrella there are radial elevations (in one specimen 32 in number), which alternate with the marginal lappets. These elevations are half cylindrical, sausage-shaped, radially situated, extending from the margin of the umbrella at its junction with the marginal lappets towards the center of the bell. They resemble on the subumbral side of the umbrella the socles of the exumbral side, and lie in the radii between those which pass through the middle line of each marginal lappet. The best preserved of all the specimens is from Station 2717. In this specimen the stumps of certain of the tentacles are present. They lie, as stated above, on the notches between the marginal lappets. The form of the abaxial rim of the marginal lappets in this specimen is bifid, recalling the appearance in the marginal lappets of *Atolla*. The exumbral surface of the marginal lappet is rough, with slight projections. Its rim is thin, the attachment and body of the lappet thick and gelatinous. The whole marginal lappet recalls those of the species *verrillii* of the genus *Atolla*. No sense bodies were seen in the alcoholic material at my control.

---

* This species is common as far north as Greenland. The allied genus *Nauphanta* somewhat resembles the young *Periphylla*, but has eight sense bodies and eight tentacles. It remains yet to be seen whether the young *Periphylla* has the same number of tentacles and sense bodies as the adult. If it has eight tentacles instead of twelve it may be readily conjectured that *Nauphanta* is a young *Periphylla*, and that immature tentacles have been mistaken for sense bodies.

I have elsewhere recorded a *Nauphanta*, *N. polaris*, Fewk., from Lady Franklin Bay, North Greenland.

There seems to be a relationship between the cold waters of great depths of the sea and those of the cold waters of the Arctic Ocean. Temperature would seem to play an important part in the relationship of medusæ from these two localities.

It is desirable that the live medusa of *Ephyroides* be studied, as the features presented by the alcoholic material are of great morphological interest. It has not seemed to me best to say anything about these questions until more is known of the anatomy of the extraordinary genus.

Family CYANEIDÆ, L. Agassiz.

CYANEA, sp.

A specimen of *Cyanea* from the Gulf Stream differs in certain respects from the *Cyanea arctica*, Per. et L., of the New England coast. It also differs from other species of this genus which have been described. With the imperfect knowledge derived from a single specimen, I hesitate to introduce a new name into the nomenclature of this genus, although there is little doubt that the specimen referred to is not the common *C. arctica*.*

Catalogue number.	Station.	North latitude.	West longitude.
		° ′ ″	° ′ ″
11668	2542	40 00 15	70 42 20
11669	2542	40 00 15	70 42 20

A much larger specimen than either of those mentioned above was collected in 1879, Station 378, No. 5124, off Cape Cod. This specimen resembles more closely than the others the common *C. arctica*, Per. et Les., but the mouth appendage and tentacles are missing. The forms of the marginal lappets are like those of *C. arctica*.

---

* One of the main differences between this *Cyanea* and *C. arctica* is found in the incisions in the marginal lappets. There are in the unknown *Cyanea* eight deep ocular incisions, eight shallower tentacular incisions, and the margin of the bell between each ocular and tentacular incision is again incised. There are therefore 32 marginal lappets.

Family PELAGIDÆ, Gegenbaur.

PELAGIA CYANELLA, P. and Les.

Catalogue number.	Station.	North latitude.	West longitude.
		° ′ ″	° ′ ″
11678	2566	37 23 00	68 08 00
11656	....		
11688	2560	39 26 00	68 03 30
....	2566	37 23 00	68 08 00
11680	2566	37 23 00	68 08 00
(6) 15225	2711	38 59 00	70 07 00
15226	2711	38 59 00	70 07 00
15236	2717	38 24 00	71 18 00
15237	2715	38 29 30	70 54 13
15239	2716	38 29 30	70 57 00
(2) 15240	2716	38 29 30	70 57 00
15245	2711–22	38° 20′–39° 13′	70° 5′ 30″–72° 12′
15765	2724	36 47 00	73 25 00
15760	2724	36 47 00	73 25 00
15757	2724	36 47 00	73 25 00
15763	2724	36 47 00	73 25 00
15762	2727	36 35 00	74 03 30
15752	2730	36 42 00	74 30 00
15758	2735	37 23 00	73 53 00
15759	2731	36 45 00	74 28 30
15761	2731	36 45 00	74 28 30
15764	2731	36 45 00	74 28 30
15747	2731	36 45 00	74 28 30

CTENOPHORA.

BEROË OVATA? Br.

Catalogue number.	Station.	North latitude.	West longitude.
		° ′ ″	° ′ ″
11658	2563	39 18 30	71 23 30
11659	2542	40 00 15	70 42 20
11842	2563	39 18 30	71 23 30
....	2575	41 07 00	65 26 30

CALLIANIRA, sp.?

Station 2585.

This is the first record of this genus from the Gulf Stream.

CAMBRIDGE, MASS., *May* 27, 1887.

EXPLANATION OF THE PLATE.

PEGANTHA, ***sp. incog.***

FIG. 1. View of Pegantha from the side.
FIG. 2. View of Pegantha from aboral region.

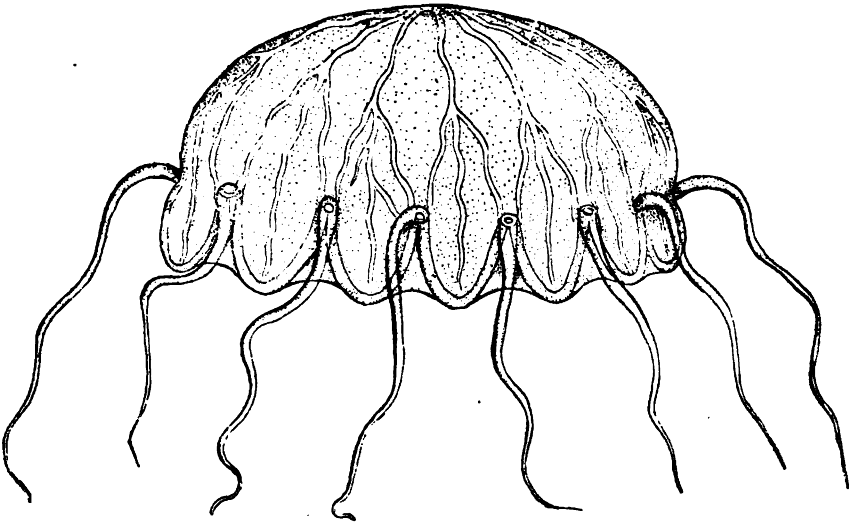

Fig. 1.

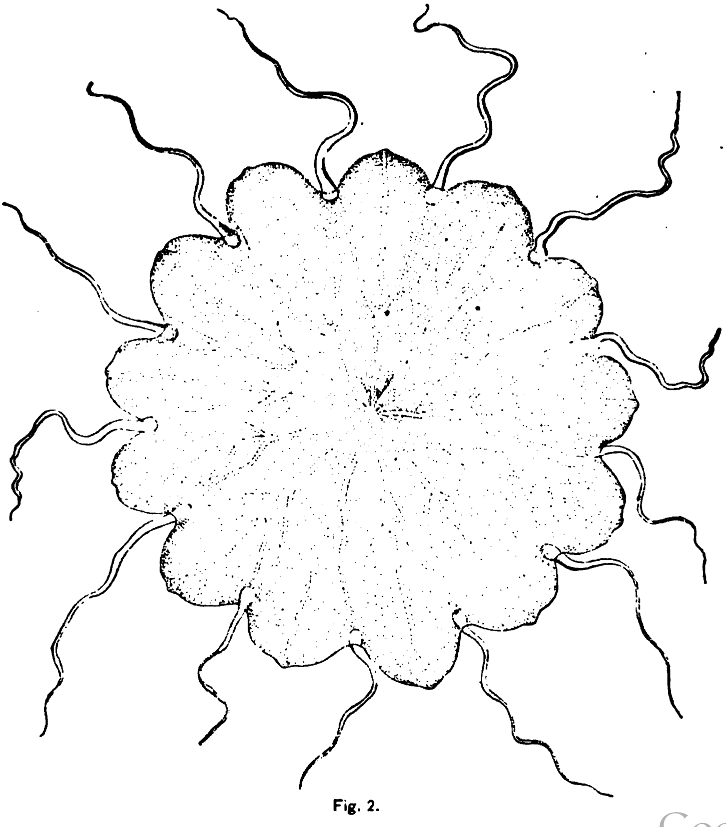

Fig. 2.

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